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AUTHOR Quirk, Thomas J.; And Others
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ABSTRACT

A Teacher Observation Scale (TOS) was developed in order to compare the behavior of teachers using the material of project PLAN with those using conventional insturctional systems. The scale listed 17 categories of teacher behavior grouped under the headings: individual instruction, group discussion, behavior modification, systems management, and miscellaneous. Two groups of observers were trained to use the TOS and were assigned to observe PLAN and control teachers in schools in the San Francisco Bay Area. This report contains an analysis of the data collected, a discussion of its implication for project PLAN, a reference list, and various supplementary data tables. (JY)

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The Development of the PLAN TOS: A Teacher Observation Scale for Individualized Instruction

Thomas J. Quirk
American Institutes for Research

Margaret T. Steen
Fremont Unified
School District

Dewey Lipe
Fremont Unified
School District

EM007954

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The original Title III ESEA proposal (Shanner, et al., 1967) stated that one of the intermediate objectives of the teacher training project was to change the behavior of the teacher in the classroom. In order to measure that objective we developed th PLAN Teacher Observation Scale (PLAN TOS) in order to observe the actual behaviors of teachers in Project PLAN classrooms.

The emphasis in the PLAN TOS is on the verbal behavior of the teacher. Non-verbal behaviors, such as gestures and facial expressions, should be taken into account by the observer in classifying the behavior of the teacher, but they are not recorded as separate behaviors except in the two categories of Behavior Modification.

Several observation scales of teacher behavior have been developed for use in traditional classrooms. The Flander's Interaction Analyses technique (Amidon and Flanders, 1963), the Verbal Interaction Category System (VICS) of Amidon and Hunter (1967), and Hough's Observational System for Instructional Analyses (1967) represent some of the better known instruments for the observation of teacher behavior. Medley and Mitzel (1958, 1959, 1963) developed an instrument named OScAR (Observation Schedule and Record) to quantify the behavior of beginning teachers so that the behavior could be correlated with a number of other variables.

All of the data reported here were collected by trained observers who observed teachers in their ongoing classrooms. The use of the PLAN TOS is an attempt to develop an objective record of the classroom behavior of teachers in individualized instructional programs. The observer tallied the behavior of the teacher into 17 predefined categories according to what behavior occurred and how often it occurred. The observer who recorded the behavior of the teacher did not record the behavior of the students. Another observer in the same classroom used the PLAN Student Observation Scale (PLAN SOS) to record the behavior of the students. The observer who used the Teacher Observation Scale (PLAN TOS) was concerned only with teacher behavior. An important difference in the PLAN

TOS from other observation instruments is its distinction between the content and process dimensions of teacher behavior and its emphasis on categories describing the systems management aspects of individualized instruction classrooms. The use of PLAN TOS requires the observer to classify the behavior of the teacher over a five-second interval into one of 17 categories. If more than one category of behavior occurred during that five-second period, the observer was instructed to record the latter category.

The observers trained to use the PLAN TOS were permitted to change a category classification at a later time only under a single exception. The exception involved the change from category 8 (tutoring) to category 9 (lecturing) whenever the teacher talked for a period of time greater than sixty seconds. For all other categories of teacher behavior, the observer was instructed to code each five-second time period as a unit and then to forget that time period.

Brief Description of the PLAN TOS Categories

The PLAN TOS was expanded to 17 categories after preliminary reliability studies indicated that these 17 categories permitted the best description of events in Project PLAN classrooms, or which we would expect to occur in these classrooms, so that the categories would be clearly defined, distinct, reliable, and would reflect important differences among teacher activities in individualized instruction that can be easily discriminated by observers. A brief description of the 17 categories of the PLAN TOS appears below:

Teacher Behavior Categories

Category Description	Category Number	Example
Individual Instruction (1 or perhaps 2 students)		
Diagnostic and didactic inquiry	(1)	The teacher asks a student, "After you divide by 2, what should you do?"
Decision facilitating	(2)	The teacher asks, "What do you think you should do to prepare yourself better for the next test?"

Solution giving	(3)	The teacher tells a student, "Chartres is in France, not Belguim."
Extending concepts and interests	(4)	The teacher asks a student to give examples from his own experience.
Silent attending	(5)	The teacher observes a student work a problem.
Group Discussion		
Modeling the discussion leader role	(6)	The teacher interrupts a group discussion to explain or point out a function of the group leader.
Leading group discussion	(7)	The teacher, leading a group discussion, asks one of the silent students what his opinion is.
Tutoring (discussion)	(8)	The teacher, leading a group discussion, asks a student to describe the TLU objective in his own words.
Providing content (lecturing)	(9)	The teacher, leading a group discussion, describes the plot of a story.
Silent attending	(10)	The teacher, leading a group discussion, pauses after calling on a non-participant.
Behavior Modification		
Giving positive verbal or non-verbal message	(11)	The teacher says to a student, "It's good to see you studying so hard today."
Giving a negative verbal or non-verbal message	(12)	The teacher criticizes a student for scuffling.
Systems Management		
Managing records and computer materials	(13)	The teacher checks test cards for marking errors.
Managing learning materials and equipment	(14)	The teacher mends a broken recording tape.

Managing student activities	(15)	The teacher tells the class, "All right children, get your TLUs and start to work."
Observing, listening, walking	(16)	The teacher walks around the classroom observing students at work.
Other		
Activities unrelated to instruction	(17)	The teacher collects lunch money.

Selecting and Training Observers

A group of four women (Group I) was trained during the middle of March, 1969, to use the teacher observation form. The training procedure was replicated with another group of four women (Group II) during the last two weeks of May, 1969.

Group I. The first group of four women ranged in age from 23 to 35. Their educational experience ranged from one year of college to one and one-half years of graduate school. Two of the group had had no teaching experience, the third had three years teaching experience and the fourth five years of teaching experience. A brief outline of the training program appears in Table 1. The observation process developed into a smooth rhythm of observing for three seconds, deciding during the fourth second which category represents that behavior, and recording during the fifth second. If a teacher switched behaviors during the three seconds, (e.g., if he changed from talking to attending to a student) the latter behavior of the interval was recorded. If a teacher performed two behaviors simultaneously, both behaviors were recorded.

The reliability study was designed to include eight observations each at th primary, intermediate, and secondary levels. Observers were randomly assigned to teams and each team observed two Project PLAN classes and two traditional classes at each level. The reliability data in Table 2 indicated that observer "A" needed additional practice and so we decided to pair observer "A" again with observers "B" and "C" for four additional observations at the end of the reliability study. These are also reported in

Table 2. All reliabilities of the extended practice for observer "A" were above 0.85. Eighteen out of 28 total reliabilities were above 0.85.

Group II. The second group of women ranged in age from 22 to 56. All four had earned a bachelors degree and one had one year of teaching experience.

The design of the reliability study with Group II is the same as that of Group I. The results are given in Table 3 and only three of the coefficients are less than 0.85.

Data Collection

The observations were organized so that all 66 Project PLAN teachers in the 14 San Francisco Bay Area schools participating in Project PLAN and 32 randomly selected non-PLAN Control teachers would be observed for three separate 20 minute observational sessions for a total of one hour's observation of each of 98 teachers. The distribution of Project PLAN and Control teachers across elementary grade levels and secondary subject areas is shown in Table 4. Observations were made by two teams of observers. One member of each team observed and recorded teacher behavior while the other member concurrently observed and recorded student behavior using a separate instrument which we have termed the PLAN SOS.

The Control teachers were randomly selected from the same schools as the Project PLAN teachers. At the elementary level five schools were randomly selected separately at each grade level. No school was asked to contribute more than three Control teachers, however, and as soon as a school's name had been drawn three times it was dropped from the list. From each school that was selected, the name of a non-PLAN teacher at that grade level was randomly selected. Two elementary schools in one district had no non-PLAN teachers at the desired grade levels so the Control teachers were drawn from a third school in that district, a school not participating in Project PLAN. Three of the Control teachers selected were

rejected by their respective principals because, in each case, the principal believed the teacher would be too uncomfortable with observers in the room. Each of the three rejected teachers was replaced by another randomly selected teacher. Three Control teachers were randomly selected from each of the four secondary schools participating in Project PLAN. None of the secondary teachers were rejected.

The principal or another administrator in each school notified both the Project PLAN teachers and the Control teachers that observers would visit their classes on three separate occasions over the period of the next four to six weeks. He explained that their visits would be unannounced, that the data would not be reported to any school official or be seen by anyone other than the observers and the research team, and that the teachers should proceed with their normal activities whether or not the observers were present. The Control teachers' participation was optional in all schools and only one teacher refused to participate.

For various reasons individual teachers, and in one case a whole school, could not be visited. One Project PLAN teacher contracted pneumonia and only one observation was made in her class. Another teacher, a Control teacher, politely refused the observers entrance to her room. One school was not visited at all because parent visitation week, standardized testing, and other special activities occupied too large a portion of the observation period to permit completion of one hour's observation of the teachers over three visits. The distribution of Project PLAN and Control teachers that were observed for one hour is shown in Table 4.

In order to obtain three observations on as many teachers as possible, observers during the final phase were permitted to observe three teachers for two consecutive 20 minute observations. All other teachers were observed on three different days over the period from April 11 through May 29. Two intermediate level PLAN level and two secondary level Control teachers were observed twice on the same day.

No substitute teachers were observed, no Control teachers were observed when the entire class was taking a test, and the observers did not notify the teachers in advance of their visit. The observers did phone the principal's office on the day before visiting a classroom to notify the principal of their visit and to check on the administrative schedule for the following day.

Hypotheses

The rationale for the hypotheses of this study is closely related to a three-day training conference that was held for all western PLAN teachers in late August 1968. The PLAN teachers viewed films and completed practice exercises in diagnosing learning problems in students and in decision-facilitating, studied four programmed booklets on student-managed behavior which included an emphasis on the use of positive reinforcement to shape student behavior, and modules on classroom organization and the function and operation of the computer services within Project PLAN. The emphasis on the pre-service August training program and throughout the in-service training programs during the school year was to train the teachers to train the students to assume responsibility for their learning by using instructional materials and equipment independent of teacher supervision so that the PLAN teachers could be relieved of this administrative duty. The August 1968 conference included an additional set of four programmed booklets which delt with student managed behavior, a module on testing within Project PLAN, a videotape model on the use of planning strategies and practice by the teacher with a student in the use of these strategies; and one-half of the PLAN teachers also viewed a videotaped model of tutoring strategies and practiced these techniques with a student while videotaping their performance.

The conference emphasized that since most of the content necessary to achieve the instructional objectives is presented in PLAN in the TLUs and since each student receives a program of studies through which he proceeds at his own best pace, lecturing to the entire class is an inappropriate behavior in many instances within a PLAN classroom. For a further discussion of the differences between a PLAN classroom and a traditional classroom, see Flanagan (1967; 1968) and Quirk (in press). Eight of the PLAN teachers reported in this study did not attend the August conference, but in

every case except for the videotapes, the PLAN consultants carried the printed materials to the teachers in their classrooms early in the fall.

Since the present version of the PLAN TOS did not permit analyses of the data into separate categories for large-group discussion and small-group discussion, no specific hypotheses are presented regarding tutoring within group discussion or in leading group discussion.

In order to compare PLAN and Control teachers on classroom observations on behaviors relevant to the management of Project PLAN and to the August, 1968 training conference, the following hypotheses are presented:

Hypothesis One: PLAN teachers will spend significantly more time than Control teachers in diagnostic and didactic inquiry, in decision facilitating, in giving positive messages within behavior modification, and in total individual instruction.

Hypothesis Two: Control teachers will spend significantly more time than PLAN teachers in providing content within group discussion, in giving negative messages within behavior modification, in managing learning materials, and in managing student activities.

Data Analysis

All of the hypotheses were tested by means of a one-tail, Mann-Whitney U Test (Siegel, 1956; Hays, 1963). In each case the PLAN and Control teachers were ranked in terms of the percent of time which each teacher spent in the activity in question, and the tabled comparisons of PLAN and Control teachers report the mean percent of time spent in each activity by the two groups of teachers.

In order to increase the number of teachers in each group, the level one and level two teachers were combined into a single group of primary level teachers. Similarly, the level five and level six teachers were combined to form the group of intermediate level teachers, and the level nine and level ten teachers were combined to form the group of secondary level teachers. The data in Tables 5, 6, 8, were corrected for ties while the data in Table 7 are uncorrected because of the size of the larger group of teachers.

Summary of PLAN and Control Teacher Comparisons

As predicted, PLAN teachers spent significantly more time than Control teachers at primary level, intermediate level, secondary level, and all levels combined in diagnostic and didactic inquiry and in total individual instruction (categories 1+2+3+4+5). The PLAN teachers at these levels spent 20 percent, 24 percent, 19 percent, and 21 percent, respectively, in diagnostic and didactic inquiry compared to 5 percent, 10 percent, 5 percent, and 7 percent, respectively, for the Control teachers. PLAN teachers also spent 36 percent, 36 percent, 28 percent, and 34 percent, respectively, in total individual instruction compared to 8 percent, 15 percent, 7 percent, and 10 percent, respectively, for the Control teachers.

There were no significant differences between the PLAN and Control teachers at any level, or when the levels were combined, in decision facilitating, providing content within group discussion, or in giving negative messages within behavior modification. In the cases of decision facilitating and in providing content within group discussion, the differences were in the predicted direction, but the large number of ties at the same percent in every instance provided an overestimate of the degree of difference between the two groups of teachers. In the case of negative message within behavior modification, the differences were in the predicted direction except that at the primary level PLAN teachers spent more time than the Control teachers in giving negative messages within behavior modification.

Contrary to the predictions, the PLAN teachers at every level spent more time than the Control teachers in managing learning materials, but the difference was significant only when all levels were combined. We were also surprised to find that, at the secondary level, Control teachers spent significantly more time than the PLAN teachers in giving positive messages within behavior modification, but the predicted direction of this difference occurred at the primary level, intermediate level, and all levels combined. This finding could be either a byproduct of the administrative schedule requirements at secondary level or a behavior typical of

the particular group of PLAN teachers at the secondary level which were observed this past spring.

The most surprising result which was contrary to the hypothesis was the fact that PLAN teachers spent significantly more time than the Control teachers in managing student activities at the primary level, intermediate level, all levels combined, and came close to a significant difference at the secondary level. The PLAN teachers at the primary level, intermediate level, secondary level, and all levels combined spent 24 percent, 25 percent, 13 percent, and 23 percent of their time, respectively, managing student activities compared to 18 percent, 15 percent, 13 percent, and 15 percent, respectively, for the Control teachers. We are hopeful that the computer programs will operate more efficiently this next year, that the instructional TLUs and module tests are more readily available to teachers at the beginning of the year, and that the teacher-training program is more effective this next year in helping teachers to train students to manage their own activities in a responsible way so that the PLAN teachers can spend more time in individual instruction and group discussion. The fact that we do not have any classroom observations from last fall prevents us from reporting whether the PLAN teachers decreased or increased the amount of time they spent in managing student activities from fall to the spring, but our classroom observation this next year should help to clarify the trend in this activity.

This next year we will also expand the PLAN TOS to include five categories for large-group discussion (i.e., discussion by the teacher with more than one-half of the class) and the same five categories under a major heading for small-group discussion (i.e., discussion by the teacher with at least three students but less than one-half of the students in the class) instead of the single major category for group discussion in the present version of the PLAN TOS. In this way we will be better able to compare PLAN and Control teachers in the amount of time they spend in different activities within different types of group discussion instead of just one type of group discussion.

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Table 1

Brief Outline of the Observer Training Program

I. Pre-training Orientation Session (about two hours)
   A. Complete the "First Practice Trials Categorizing Student and Teacher Behavior"
   B. Read "Operational Definitions of Teacher Behavior Categories".
   C. Peruse materials describing Project PLAN.

II. Orientation to Project PLAN Classrooms (about one-half day)
   A. Take a clip board with stop watch and observation forms.
   B. In several PLAN classrooms the trainer will point out examples of the teacher behavior categories as they occur.

III. Simulated Practice (about one-half day)
   A. Practice categorizing written examples of teacher behavior.
   B. Practice tallying responses and computing Scott's π.

IV. Practice Observation with Frequent Feed-back (as needed)
   A. In pairs, in a functioning classroom, discuss teacher behavior (about five mintues).
   B. Independently categorize teacher behavior (two minutes).
   C. Compare and discuss categorization decisions.
   D. Repeat B and C for about 20 minutes.
   E. Outside the classroom discuss unresolved questions and problems with the trainer.

V. Trial Reliability (as needed)
   A. In pairs, independently observe teachers in diverse classrooms for about 20 minutes each.
   B. Computer observer reliability in each classroom.

VI. Formal Reliability Study of the Instrument

Table 2

Observer Reliability

Group I

Grade Level Observed	Observer Pair	Scott's π			
		Project PLAN classes		Traditional classes	
Primary (Grades 1 & 2)	A-B	.81	.70	.72	.72
	C-D	.85	.82	.85	.97
Intermediate (Grades 4,5, & 6)	A-C	.61	.00	.94	.88
	B-D	.84	.89	.98	.85
Secondary (Grades 9 & 10)	A-D	.90	.91	.92	.95
	B-C	.67	.83	.87	.95
Secondary@ (Grades 9 & 10)	A-B	.91		.87	
	A-C	.95		.95	

@Reliabilities of the extended practice sessions for observer "A".

Table 3

Observer Reliability

Group II

Grade Level Observed	Observer Pairs	Scott's π			
		Project PLAN classes		Traditional classes	
Primary (Grades 1 & 2)	A-B	.96	.89	.92	.91
	C-D	.88	.79	.87	.95
Intermediate (Grades 4,5 & 6)	A-C	.88	.90	.89	.91
	B-D	.88	.92	.91	.71
Secondary (Grades 9 & 10)	A-D	.90	.95	.97	.95
	B-C	.81	.85	.93	.85

Table 4

Distribution of Project PLAN and Control Teachers

	Number of Elementary Teachers by Grade Level				Number of Secondary Teachers by Subject Taught				
	1	2	5	6	English	Social Studies	Math	Science	Total
Project PLAN Teachers									
Number of Teachers	12	12	12	12	5	5	4	4	66
Number Observed for One Hour	10	11	10	11	4	5	4	3	58
Control Teachers									
Number Randomly Selected	5	5	5	5	3	3	3	3	32
Number Observed for One Hour	4	4	5	5	2	3	2	3	28

TABLE 5

Comparison of PLAN Primary Level Teachers with Control Primary Level Teachers

Category	Teacher Observation Scale					
	Frequency	Percent	Frequency	Percent	Mann-Whitney	
	PLAN Primary Teachers (N=21)		Control Primary Teachers (N=8)			
Individual Instruction					U	z
1. Diag., & didac. inq.	3001	19.8	293	5.08	11	3.58**
2. Dec. facil.	13	0.08	0	0.00	76	ties large
3. Sol. giv.	109	0.72	30	0.52		
4. Ext. con. & int.	28	0.18	0	0.00		
5. Sil. att.	2225	14.71	109	1.89		
Group Discussion						
6. Mod. dis. lead.	0	0.00	0	0.00		
7. Lead. gr. dis.	0	0.00	4	0.06		
8. Tutor.	1123	7.42	1407	24.43		
9. Prov. cont.	57	0.37	238	4.13	47	ties large
10. Sil. att.	769	5.08	1239	21.51		
Behavior Modification						
11. Pos. mess.	299	1.97	80	1.38	61.5	1.11
12. Neg. mess.	152	1.00	37	0.64	67	0.83
Systems Management						
13. Man. comp. mat.	82	0.54	7	0.12		
14. Man. learn. mat.	1489	9.84	505	8.76	65.5	0.90
15. Man. stud. act.	3697	24.45	1042	18.09	41.5	2.08*
16. Obs. list., walk.	1982	13.10	722	12.53		
Other						
17. Act. unrel. to inst.	93	0.61	46	0.79		
Total Individual Instruction (1+2+3+4+5)	5376	35.55	432	7.50	7.5	3.74**
Total Group Discussion (6+7+8+9+10)	1979	13.08	2888	50.14		
Total Behavior Modification (11+12)	423	2.79	117	2.03		
Total Systems Management (13+14+15+16)	7248	47.93	2276	39.52		
TOTAL (1 through 17)	15119		5759			

*p<.05
**p<.01

TABLE 6

Comparison of PLAN Intermediate Level Teachers
with Control Intermediate Level Teachers

Category	Teacher Observation Scale					
	Frequency	Percent	Frequency	Percent	Mann-Whitney	
	PLAN Intermediate Teachers (N=21)		Control Intermediate Teachers (N=10)			
					U	z
Individual Instruction						
1. Diag., & didac. inq.	3613	23.94	701	9.81	22	3.5 **
2. Dec. facil.	24	0.15	0	0.00	85	ties large
3. Sol. giv.	356	2.35	97	1.35		
4. Ext. con. & int.	48	0.31	0	0.00		
5. Sil. att.	1423	9.43	242	3.38		
Group Discussion						
6. Mod. dis. lead.	0	0.00	0	0.00		
7. Lead. gr. dis.	0	0.00	4	0.05		
8. Tutor.	960	6.36	1709	23.92		
9. Prov. cont.	8	0.05	272	3.80	34	ties large
10. Sil. att.	582	3.85	1390	19.45		
Behavior Modification						
11. Pos. mess.	131	0.86	32	0.44	67	1.61
12. Neg. mess.	122	0.80	87	1.21	100	0.21
Systems Management						
13. Man. comp. mat.	536	3.55	22	0.30		
14. Man. learn. mat.	1295	8.58	455	6.36	86	0.80
15. Man. stud. act.	3724	24.68	1069	14.96	25	3.38**
16. Obs. list., walk.	2187	14.49	1044	14.61		
Other						
17. Act. unrel. to inst.	77	0.51	20	0.27		
Total Individual Instruction (1+2+3+4+5)	5464	36.21	1040	14.55	24	3.42**
Total Group Discussion (6+7+8+9+10)	1550	10.27	3375	47.24		
Total Behavior Modification (11+12)	253	1.67	119	1.66		
Total Systems Management (13+14+15+16)	7742	51.31	2590	36.25		
TOTAL (1 through 17)	15086		7144			

*p<.05
**p<.01

TABLE 7

Comparison of PLAN Secondary Level Teachers with Control Secondary Level Teachers

Category	Teacher Observation Scale				
	Frequency	Percent	Frequency	Percent	Mann-Whitney
	PLAN Secondary Teachers (N=16)		Control Secondary Teachers (N=10)		
Individual Instruction					U
1. Diag., & didac. inq.	2261	19.26	328	4.55	18**
2. Dec. facil.	38	0.32	17	0.23	78 ties large
3. Sol. giv.	171	1.45	32	0.44	
4. Ext. con. & int.	33	0.28	4	0.05	
5. Sil. att.	739	6.29	112	1.55	
Group Discussion					
6. Mod. dis. lead.	0	0.00	0	0.00	
7, Lead. gr. dis.	18	0.15	18	0.24	
8. Tutor.	850	7.24	2444	33.93	
9. Prov. cont.	148	1.26	691	9.59	48* ties large
10. Sil. att.	636	5.42	1029	14.28	
Behavior Modification					
11. Pos. mess.	23	0.19	42	0.58	35**
12. Neg. mess.	70	0.59	47	0.65	73
Systems Management					
13. Man. comp. mat.	526	4.48	84	1.16	
14. Man. learn. mat.	1754	14.94	607	8.42	54
15. Man. stud. act.	2109	17.97	912	12.66	49
16. Obs. list., walk.	2182	18.59	726	10.08	
Other					
17. Act. unrel. to inst.	176	1.49	109	1.51	
Total Individual Instruction (1+2+3+4+5)	3242	27.62	493	6.84	19**
Total Group Discussion (6+7+8+9+10)	1652	14.07	4182	58.06	
Total Behavior Modification (11+12)	93	0.79	89	1.23	
Total Systems Management (13+14+15+16)	6571	55.99	2329	32.33	
TOTAL (1 through 17)	11734		7202		

*p<.05
**p<.01

TABLE 8

Comparison of PLAN and Control Teachers (all levels)

Category	Teacher Observation Scale					
	Frequency	Percent	Frequency	Percent	Mann–Whitney	
	PLAN Teachers (N=58)		Control Teachers (N=28)			
Individual Instruction					U	z
1. Diag., & didac. inq.	8875	21.16	1322	6.57	246	5.22**
2. Dec. facil.	75	0.17	17	0.08	704	ties large
3. Sol. giv.	636	1.51	159	0.79		
4. Ext. con. & int.	109	0.25	4	0.01		
5. Sil. att.	4387	10.46	463	2.30		
Group Discussion						
6. Mod. dis. lead.	0	0.00	0	0.00		
7, Lead. gr. dis.	18	0.04	26	0.12		
8. Tutor.	2933	6.99	5560	27.65		
9. Prov. cont.	213	0.50	1201	5.97	392	ties large
10. Sil. att.	1987	4.73	3658	18.19		
Behavior Modification						
11. Pos. mess.	453	1.08	154	0.76	658	1.43
12. Neg. mess.	344	0.82	171	0.85	785.5	0.25
Systems Management						
13. Man. comp. mat.	1144	2.72	113	0.56		
14. Man. learn. mat.	4533	10.82	1567	7.79	624	1.74*
15. Man. stud. act.	9530	22.72	3023	15.03	382.5	3.97**
16. Obs. list., walk.	6351	15.14	2492	12.39		
Other						
17. Act. unrel. to inst.	346	0.82	175	0.87		
Total Individual Instruction (1+2+3+4+5)	14082	33.57	1965	9.77	462.5	6 **
Total Group Discussion (6+7+8+9+10)	5181	12.35	10445	51.95		
Total Behavior Modification (11+12)	769	1.83	325	1.61		
Total Systems Management (13+14+15+16)	21561	51.41	7195	35.78		
TOTAL (1 through 17)	41939		20105			

*p<.05

**p<.01

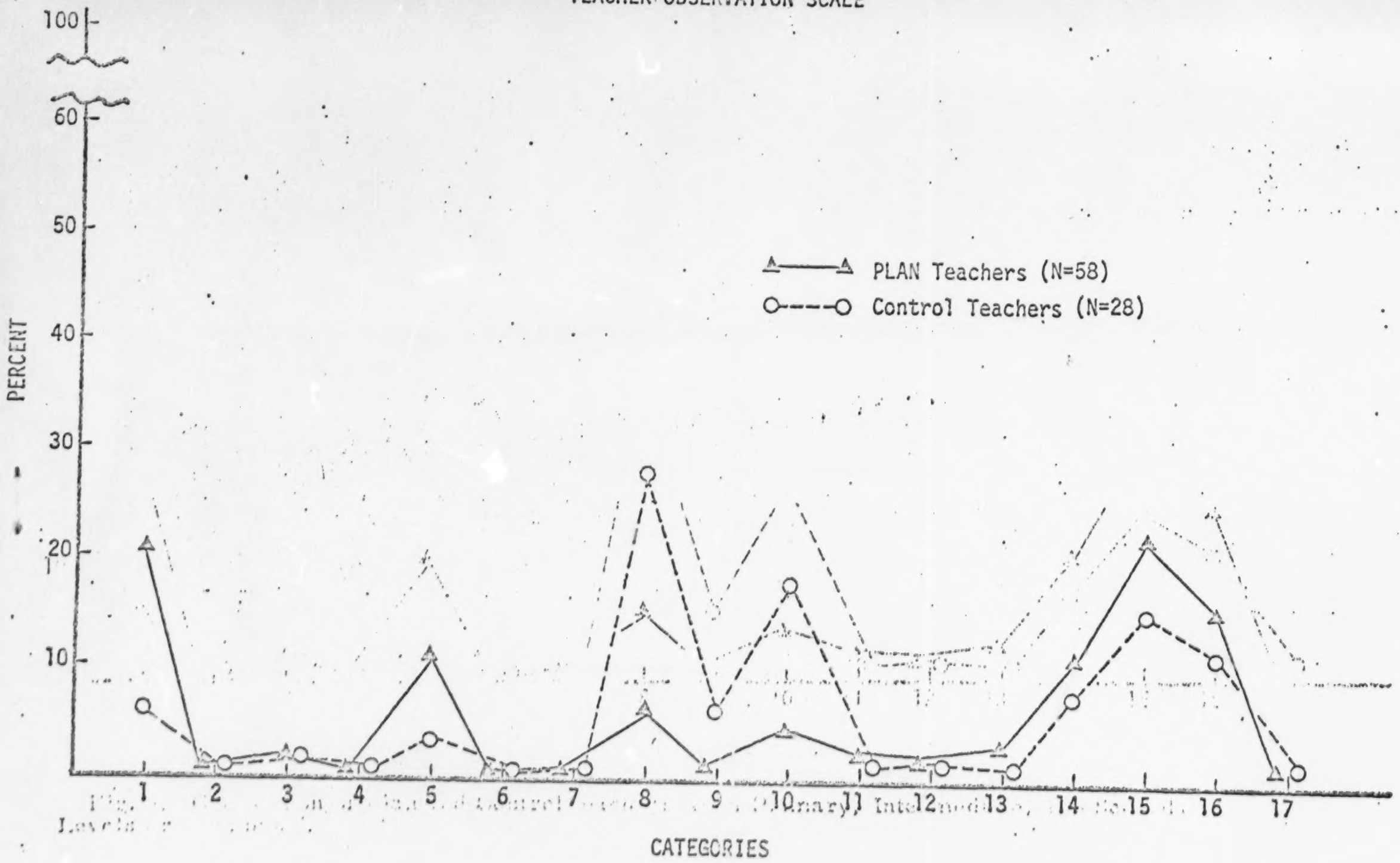

Fig. 1. Comparison of Plan and Control teachers when Primary, Intermediate, and Secondary Levels are combined.

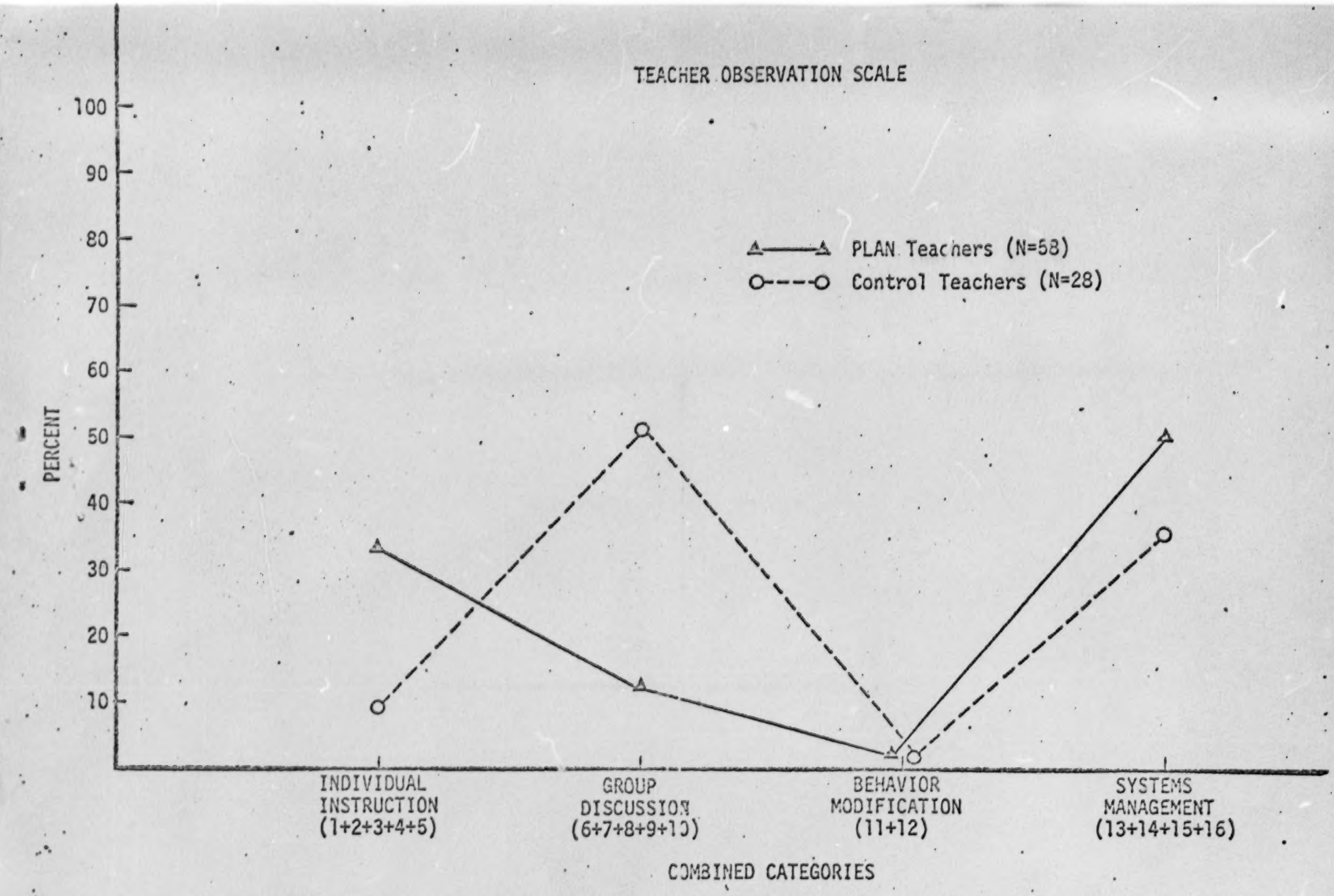

Fig. 2. Comparison of Plan and Control teachers on combined categories when Primary, Intermediate, and Secondary Levels are combined.